

## ABSTRACT

The present invention relates to methods and apparatuses for characterization of single polymers. In particular, the invention relates to methods and apparatuses for determination of the velocities of single elongated polymers. Center-of-mass velocity, center-to-center velocity, end-to-end velocity and rise-time velocity are determined using time-correlated measurements of single elongated polymers in two or more detection zones. The invention also relates to methods of determining lengths and molecular masses of single polymers and to methods of determining the distance between landmarks on a single polymers based on their velocities. The invention further relates to methods of single-molecule DNA restriction fragment analysis.

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